



November 11, 2005

Marlene H. Dortch  
Secretary  
Office of the Secretary  
Federal Communications Commission  
445 12th Street, SW  
Washington, DC 20554

Re: *Ex Parte* Presentation in WT Docket No. 01-309  
Section 68.4(a) of the Commission's Rules Governing Hearing Aid  
Compatible Telephones

Dear Ms. Dortch:

Enclosed is a copy of a letter to Julius Knapp, Deputy Chief of the Office of Engineering and Technology. Pursuant to Section 1.1206(b)(2) of the Commission's rules, one copy of this letter is being filed electronically for inclusion in the public record of the above referenced proceeding.

If there are any questions regarding this matter, please do not hesitate to contact the undersigned.

Sincerely,

A handwritten signature in black ink, appearing to read "Thomas Goode".

---

Thomas Goode  
Associate General Counsel  
The Alliance for Telecommunications  
Industry Solutions  
1200 G Street, NW  
Suite 500  
Washington, DC 20005

Attachment

November 11, 2005

Julius P. Knapp  
Deputy Chief  
Office of Engineering and Technology  
Federal Communications Commission  
445 12th Street, SW  
Washington, DC 20554

Re: *Ex Parte* Presentation in WT Docket No. 01-309  
Section 68.4(a) of the Commission's Rules Governing Hearing Aid  
Compatible Telephones

Dear Mr. Knapp:

The Alliance for Telecommunications Industry Solutions (ATIS), on behalf of the ATIS Incubator Solutions Program #4- Hearing Aid Compatibility (AISP.4-HAC or ATIS Incubator), hereby submits this update on AISP.4-HAC's efforts to investigate and find solutions to challenges faced by manufacturers and service providers in meeting the Commission's hearing aid compatibility requirements and wireless devices operating in the low band (800 – 960 MHz) and at higher power (2 watts). AISP.4-HAC has reached an agreement via consensus regarding band differentiation in wireless devices operating between the bands below 960 MHz and those above 960 MHz (high band).

This letter and the attached presentation provide additional technical data supporting the ATIS Incubator's findings that the released version of C63.19 Standard did not accurately reflect the hearing aid user's experience with low band wireless devices. Based on this additional data, the ATIS Incubator remains convinced that the C63.19 Standard must reflect the difference in hearing aid immunity between the low and high bands.

### **Background - The Need for Band Differentiation**

The AISP.4-HAC Incubator focused its initial efforts on testing for RF hearing aid compatibility (HAC) under the C63.19 Standard. Performance measurements and testing, including round-robin testing among test labs, were performed in order to meet the HAC compliance deadline of September 16, 2005. Through round-robin testing and the ATIS Incubator's suggestions for improvements to the C63.19 Standard, the members of the AISP.4-HAC made significant progress for manufacturers to confidently measure their products.

In the evaluation of test results and analysis of the Standard, it was discovered that no manufacturer of GSM wireless devices operating in the 850 MHz band could obtain an M3 or better rating on their products prior to the September 16, 2005 deadline. Following this discovery, the ATIS Incubator formed Working Group 9 (WG-9) on 850MHz and Higher Power Challenges in June 2005 to identify potential solutions to this anomaly within the existing C63.19 Standard. Numerous solutions were examined, but none were acceptable to manufacturers, service providers and consumer advocates.

Testing performed by AISP.4-HAC WG-9 member company Cingular Wireless determined that the interference to hearing aids from wireless devices was frequency dependent. Tests performed by the AISP.4-HAC WG-9 verified these findings. Moreover, these findings are consistent with existing European and Australian standards and European and US studies.

Additionally, the AISP.4-HAC notes that the difference in hearing aid immunity between the low band frequencies and the 1900MHz band was acknowledged during the development of the C63.19 Standard, but was never incorporated into the 2001 version of the Standard.

### **Recent Incubator Activity**

In October 2005, the HAC Incubator analyzed additional data from the testing of hearing aid immunity to wireless devices by the European Hearing Instrument Manufacturers Association (EHIMA). EHIMA has sponsored an ongoing study of over 700 hearing aids, from 1997 to present, that tracks the progress of hearing aid immunity based on IEC 60118-13. The IEC standard was created to measure interference to a hearing aid user in a bystander situation (e.g. a cell phone in close proximity to a hearing aid user and causing interference to the hearing aid). The EHIMA study is a far field, low power, Gigahertz Transverse ElectroMagnetic Cell (GTEM) test created to replicate the bystander condition.

The EHIMA data had to be converted to a high power, near field measurement in order for this data to be compared to the HAC near field data. The AISP.4-HAC WG-9 created a conversion method based on principles of physics and the Oklahoma University EMC Study paper by Schlegel and Grant, entitled "Modeling the Electromagnetic Response of Hearing Aids to Digital Wireless Phones." (See Schlegel, R.E. and Grant, F.H. "Modeling the Electromagnetic Response of Hearing Aids to Digital Wireless Phones," *IEEE Transactions on Electromagnetic Compatibility*, Vol. 42, Is. 4 pp.347-357 (November 2000)). The resulting analysis supports a 10 dB field strength difference between the low and high frequency bands for wireless devices. A presentation describing this analysis is also attached to this letter.

Following the analysis of the EHIMA data by the WG-9, the AISP.4-HAC reached agreement that there is a need for frequency banding differentiation in the C63.19

Standard, and that the appropriate difference between the 850 MHz and 1900 MHz bands should be 10 dB.

### **Additional Industry Findings**

ASC C63 is re-visiting the frequency banding issue in a Project Initiation Notification C (PIN C) Working Group. The PIN-C recognized that: (1) the “wireless device frequency of operation in determining the category ratings ... is based on the interference potential to hearing aids from the operating frequency of the wireless device...”; (2) “some wireless devices operate on more than 1 frequency band and are typically dual band”, and (3) the longer wavelengths (lower frequency of operation) have been shown to produce less interference potential to hearing aids than shorter wavelengths (higher frequencies of operation).”

Studies by Gallaudet University have also consistently shown that hearing aid users have comparable listening experience with low band iDEN M1-rated wireless devices as with M3-rated 1900 MHz CDMA wireless devices.

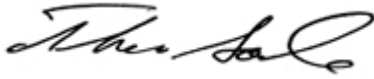
A consultant to Self Help for Hard of Hearing People (SHHH), presented his analysis of the EHIMA data to the HAC Incubator at its October 31, 2005, meeting. The analysis of the data concurs that the difference in immunity between the 850 MHz and 1900 MHz frequency bands was 10 dB or higher.

### **Conclusion**

The AISP.4-HAC's test data and analysis supports the inclusion of frequency band differentiation in the C63.19 Standard in order to reflect the difference in hearing aid immunity between low band wireless devices and those operating in the 1900 MHz band. AISP.4-HAC's conclusion is based on multiple data and analyses that recognize that the C63.19 Standard was overly conservative in its failure to include frequency banding differentiation for wireless devices, and is not intended to simply relieve the wireless industry from HAC obligations. Further, this change does not guarantee that all 850 MHz phones will achieve an M3 rating, but will allow for additional phone choices for consumers. The data demonstrates that hearing aid users have no appreciable difference in their experience using an M3-rated 1900 MHz wireless device as they would using an M1-rated low band wireless device. The ATIS Incubator has communicated this recommendation to C63 and is pleased to see that the recently balloted C63.19-2005 rd 3.10 includes the Incubator-recommended 10 dB frequency banding differentiation for wireless devices.

If there are any questions about this matter or if you would like us to provide a more detailed presentation regarding this issue, please do not hesitate to contact the undersigned.

Sincerely,



---

Thomas Goode  
Associate General Counsel  
The Alliance for Telecommunications  
Industry Solutions  
1200 G Street, NW  
Suite 500  
Washington, DC 20005

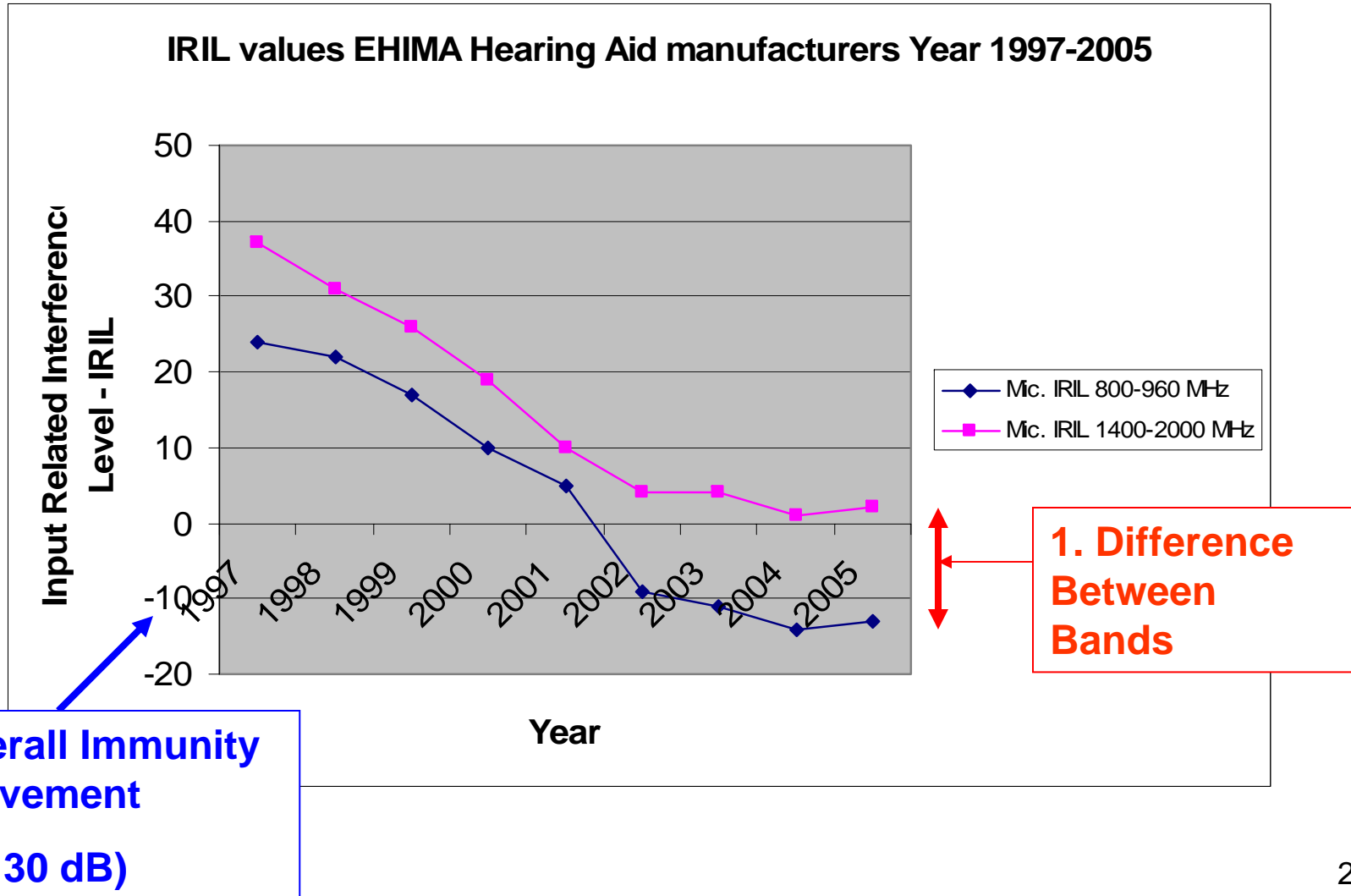
Attachment

cc: Dr. Rashmi Doshi, Chief of the Laboratory Division, Office of Engineering  
Technology  
Martin Perrine, Electronic Engineer, Laboratory Division, Office of Engineering  
Technology  
Angela Giancarlo, Associate Chief, Public Safety & Critical Infrastructure  
Division, WTB  
Fred Campbell, Legal Advisor for Wireless Issues, Office of Chairman Martin  
Mel Frerking, Director of WTS, Cingular Wireless  
Mary Jones, Consultant, T-Mobile  
Steve Coston, Technical Manager, Regulatory Project Office, Sony Ericsson Mobile  
Communications  
Tom Victorian, Vice President, Starkey Laboratories, Hearing Industries  
Association  
James Turner, Technical Coordinator, ATIS  
Martha Ciske, Committee Administrator, ATIS

# ANALYSIS OF THE DELTA HEARING AID IMMUNITY DATA AND THE PROPOSED C63.19 FREQUENCY BANDING

*This presentation has been edited for its inclusion in the AISP.4-HAC November 11, 2005 exparte communication to the FCC. The original and detailed data presentation to the AISP.4-HAC Incubator October 31, 2005 is available at [http://www.atis.org/hac/docs/2005/WG9\\_Frequency\\_Banding\\_Analysis.ppt](http://www.atis.org/hac/docs/2005/WG9_Frequency_Banding_Analysis.ppt)*

# BYSTANDER: 3 V/m, 2 V/m



# PROPOSAL: 10 dB Differentiation FOR WD ON LOW BAND (< 960 MHz)

- 10 dB Differentiation (Up to 354.8 V/m) for Wireless Devices needs to consider:
  - 1.) Difference Between Frequency Bands (850 MHz vs. 1900 MHz)
  - 2.) Field Strength Hearing Aid was Tested
    - Bystander: 3 V/m and 2 V/m
    - User: 75 V/m and 50 V/m
    - Wireless Device: M1 (354.8 V/m) and M3 (112.2 V/m)
  - 3.) Overall Immunity Improvement (IRIL) and Measurement
    - 1kHz, 80% AM
      - GTEM (Far Field)
      - Near Field



# HEARING AID IMMUNITY TEST: C63.19 vs. IEC 60118-13

## C63.19

- Method 1: Near Field
- At 900 MHz
  - Max RF + 3 dB, 1kHz 80% AM
- At 1800 MHz
  - 1W with 1kHz 80% AM.
- Method 2: WB-GTEM
- At 800-950 MHz
  - Increase Field Strength to Produce 55 dB IRIL in HA
- At 1600 – 2500 MHz
  - Increase Field Strength to Produce 55 dB IRIL in HA

## IEC60118-13

- GTEM only
- 800-960 MHz
  - Bystander: 3 V/m
  - User: 75 V/m
- 1400-2000 MHz
  - Bystander: 2 V/m
  - User: 50 V/m

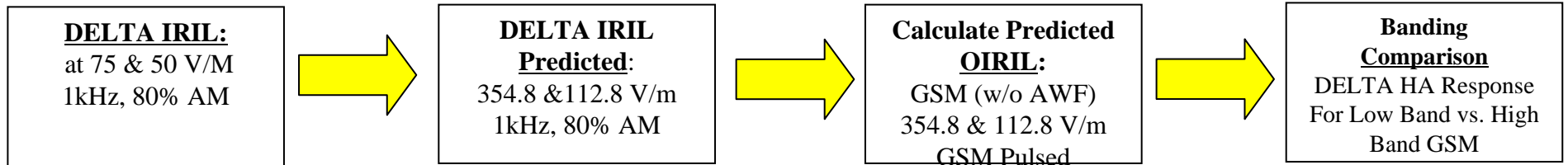
# WIRELESS DEVICE FIELD STRENGTHS

- 1900 MHz Wireless Devices are qualifying as M3
  - 63.1 V/m to 112.2 V/m
  - w/ AWF (-5) 47.3 V/m to 84.1 V/m
- 850 MHz Wireless Devices are qualifying at M1
  - 199.5 V/m to 354.8 V/m
  - w/ AWF (-5) 149.6 V/m to 266.1 V/m

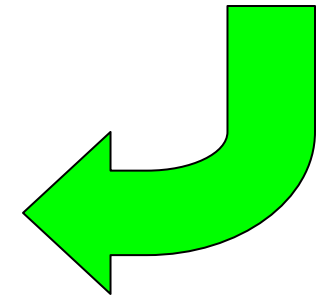
# BANDING DISCUSSION

- Recent Measurements of Banding:
  - Several Banding Tests performed in the Cingular Wireless lab
  - Real World Testing at 2005 SHHH Convention
  - DELTA Hearing Aid study
- Banding has been proposed in C63.19 rd 3.10
  - At C63 meeting in Irvine, CA: Discussion of 10 dB was debated and C63 asked for additional data to substantiate 10 dB
- The HAC Incubator analyzed additional DELTA data for 2003, 2004, 2005 regarding banding.

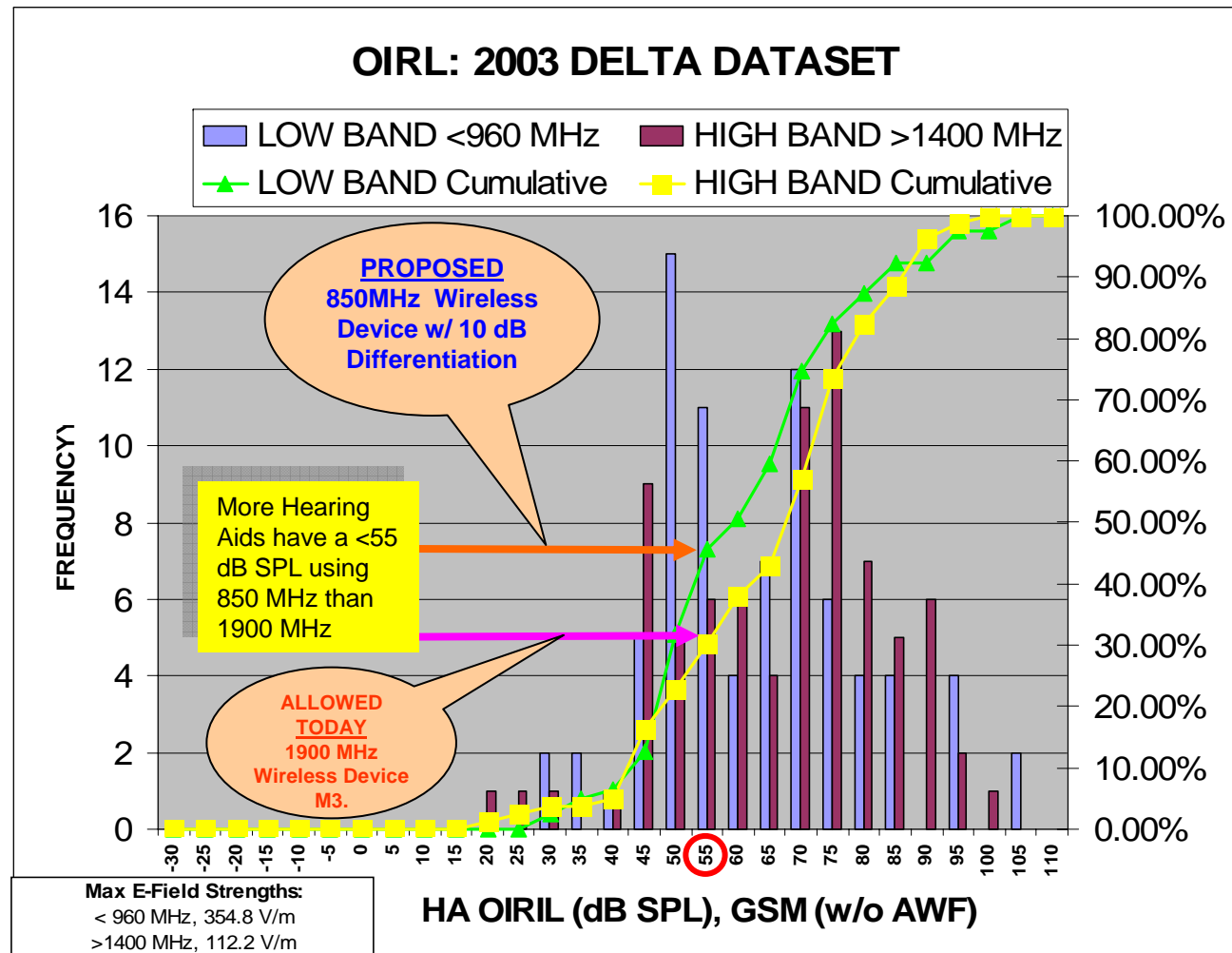
# DATA ANALYSIS FLOW



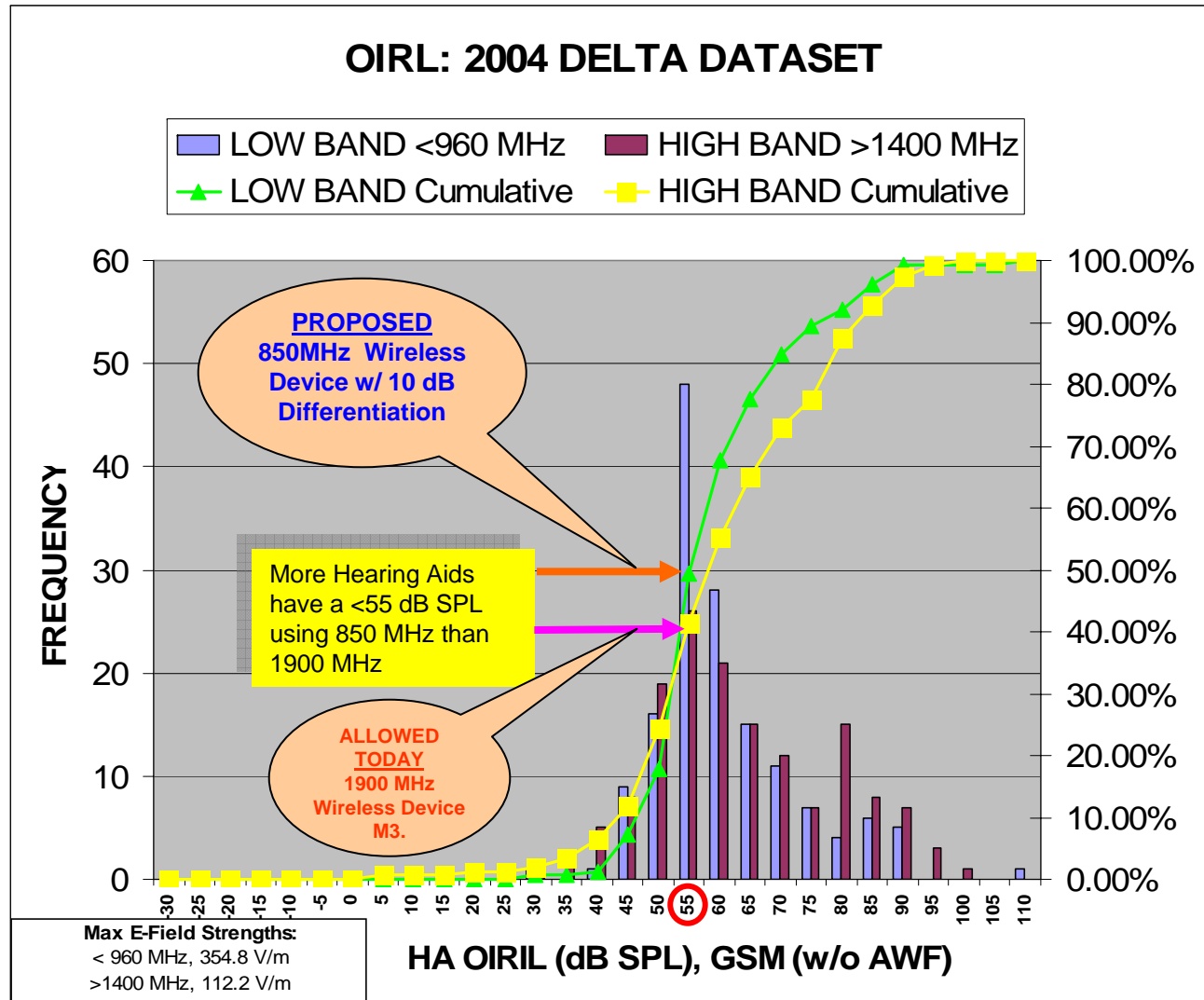
Is 850 MHz 2W WD with 10 dB  
Differentiation (354.8 V/m M rating) worse  
than the response 1900 MHz 1W WD  
(112.8 V/m M rating) to Hearing Aids using  
the DELTA 2003 – 2005 Hearing Aid IRIL  
data?



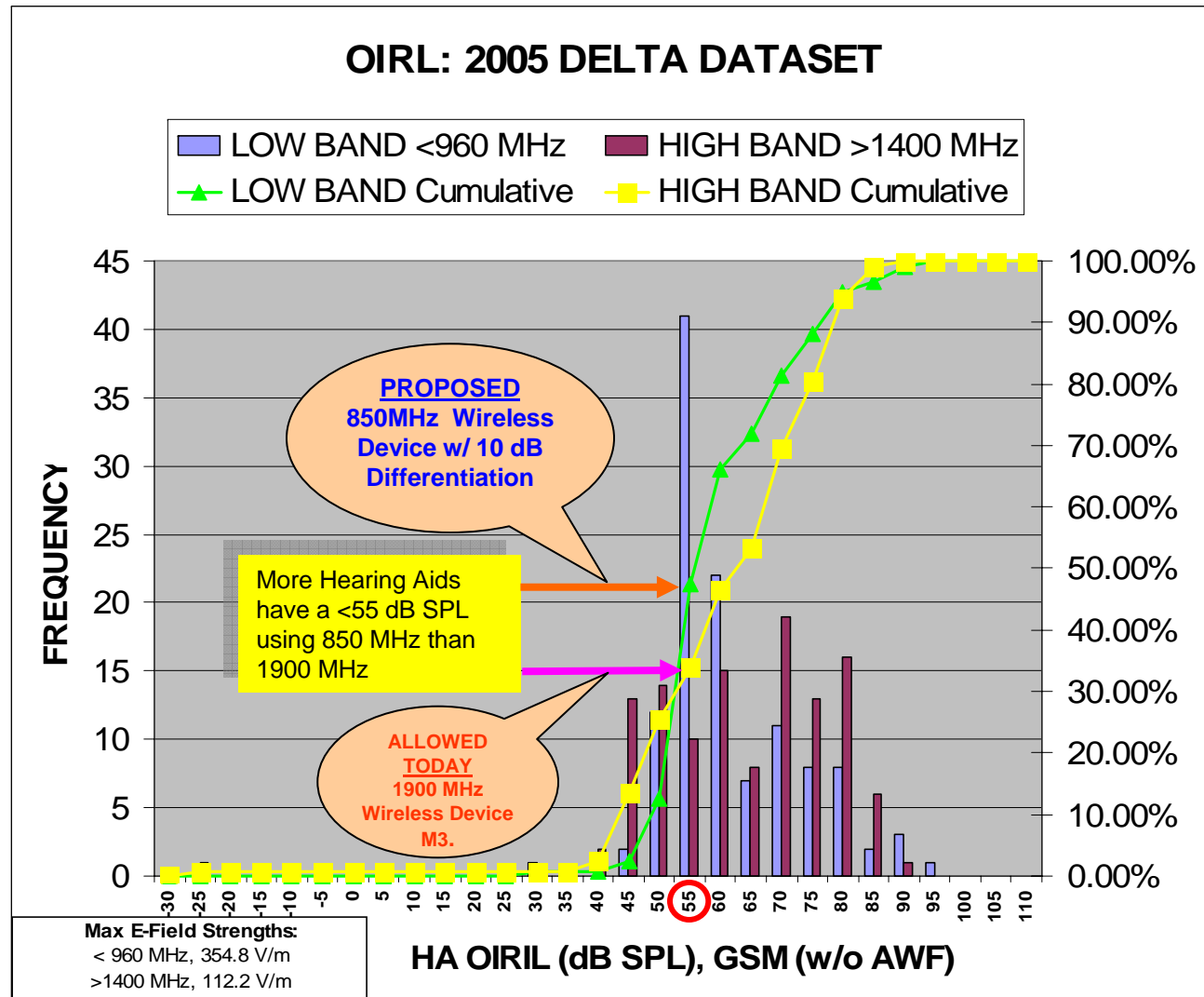
# 2003: 850 BETTER THAN 1900 UP TO 55 dB SPL



# 2004: 850 BETTER THAN 1900 UP TO 55 dB SPL



# 2005: 850 BETTER THAN 1900 UP TO 55 dB SPL



# OIRIL YEARLY SUMMARY: 2003 - 2005 DELTA DATA

2003		2004		2005	
LOW BAND <960 MHz 354.8 V/m	HIGH BAND >1400 MHz 112.2 V/m	LOW BAND <960 MHz 354.8 V/m	HIGH BAND >1400 MHz 112.2 V/m	LOW BAND <960 MHz 354.8 V/m	HIGH BAND >1400 MHz 112.2 V/m
PROPOSED	ALLOWED	PROPOSED	ALLOWED	PROPOSED	ALLOWED
# of HA with ≤ 55 dB SPL	# of HA with ≤ 55 dB SPL	# of HA with ≤ 55 dB SPL	# of HA with ≤ 55 dB SPL	# of HA with ≤ 55 dB SPL	# of HA with ≤ 55 dB SPL
36	24	75	63	56	40

Proposed  
10 dB (354 V/m)  
Differentiation  
for 850 MHz  
Wireless  
Devices

Allowed Today  
M3 Rated (112  
V/m) for 1900  
MHz  
Wireless  
Devices



# RESULTS

- **2003 – 2005 Totals**

LOW BAND (<960 MHz): 167 Hearing Aids with  $\leq 55$  dB SPL

HIGH BAND (>1400 MHz): 127 Hearing Aids with  $\leq 55$  dB SPL

- Looking closely at the curves, we see that Year over Year, MORE HEARING AIDS would have a lower Overall IRIL (up to 55 dB SPL) on the 850 Band than the 1900 MHz band (36 vs. 24, 75 vs. 63, 56 vs. 40).

- This matches results seen from the Previous Lab Testing and User Testing at 2005 SHHH Convention.

# SUMMARY

- With a 10 dB Differentiation and based on the DELTA 2003 - 2005 Hearing Aid Improvements, More Hearing Aid Consumers using a wireless device with a 10 dB (354.8 V/m) Differentiation on the 850 MHz Low band would still have an overall better experience ( $\leq 55$  dB SPL) than the 1900 MHz High Band (112.8 V/m).
- Allowing the 10 dB differentiation puts the 850 MHz wireless device on level with what the 1900 MHz wireless devices are allowed today to consumers
  - Based on the Frequency Banding Effect on Hearing Aid immunity and overall IRIL improvements as reported in the DELTA data (2003-2005).